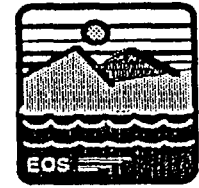


EOS

EOS Funding FY1991 - FY2000



- Total FY1991 - FY2000 \$8B
 - Reduction of \$3B from previous expectation

Committee directed NASA to adjust the EOS program as follows:

“..the total project cost through fiscal year 2000, exclusive of construction of facility, launch, and tracking requirements, shall be capped at \$8,000,000,000. The Committee considers this amount to be a new funding floor below which the project shall not go...”

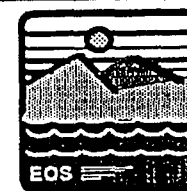
“...a firm, fixed cap on the development costs for all EOS instruments through fiscal year 2000, with a cap on the amount of funds for instruments specified by each EOS platform, including EOS AM-1.”

“...the agency should adopt a common spacecraft approach for all EOS platforms after the initial EOS AM-1 spacecraft.”

“...the agency shall convene the EOS Investigator Working Group, in consultation with the Environmental Protection Agency, to narrow and refine the number of data products that will be baselined for the EOS data information system (EOSDIS).”

EOS

EOS Funding FY1991 - FY2000

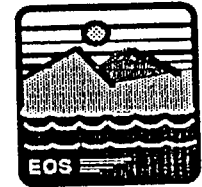


“...the Nation’s fiscal crisis beckons NASA and the Earth systems science community to be more disciplined in setting rigorous priorities for EOS. These priorities should be driven not to achieve scientific ends in and of themselves, but rather the development of sound policy to respond to the growing phenomena of global climate change.”

“...establish a management plan for its network of eight data active archive centers (DAAC’s) including a precise delineation of the scientific and policy roles for each DAAC, and a multi-year budget estimate through fiscal year 2000.”

EOS

EOS Funding FY1993



- EOS — FY1993

\$391M

- Received total request

NOTE:

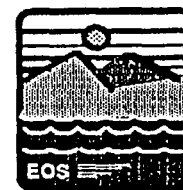
All reductions occur FY1994 through FY2000

Remote Sensing and Environmental Monitoring of Planet Earth Review Panel
OMB Submission
EOS (\$M)

FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	TOTAL - FY2000
186.6	250.0	391.0	483.5	909.6	1,015.9	1,071.0	1,208.7	1,183.1	1,291.6	8,000
(-)	(-)	(-)	(-191.5)	(-358.4)	(-431.1)	(-459.0)	(-572.6)	(-470.4)	(-517.0)	(-3,000)

EOS

Reductions

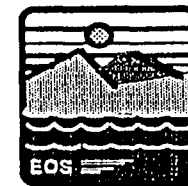


Partial list:

- Climsat \$14.3M
 - NASA received in FY92 but spent it in another area so it is being deducted this FY
- Airborne \$ 3.1M
 - Impacted ARC C-130
 - Wallops still has a C-130
- Landsat \$20.0M (pending review)

EOS

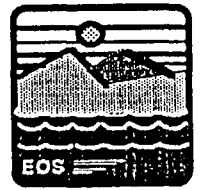
More Reductions



- Earth Science MO & DA \$10.0M
 - Cancelling Nimbus-7 (TOMS, ERB)
 - Cancelling ERBS (ERBE and SAGE II)
 - TOPEX and UARS - analysis being reduced

EOS

EOSDIS

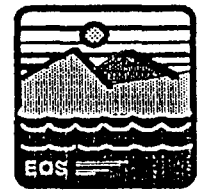


“The Committee is concerned that NASA has failed to issue the EOSDIS core system contract. The Committee directs NASA to make its selection expeditiously.”

- **Len Fisk has selected Hughes Information Technology Center for negotiating a contract for the EOSDIS Core System**
 - **TRW is being debriefed**

EOS

Payload Panel Recommendations



INSTRUMENTS

High-Resolution Imaging Spectrometer

- Recommends current HIRIS science investigation continue as planned through its projected completion in FY1994
 - Red/Blue Team recommended cancellation of HIRIS

Instruments for Stratospheric Chemistry and Dynamics

- Supports Red/Blue Team proposal to fly EOS-CHEM in 2002
 - Make timely selection between MLS and SAFIRE
- Recommends two SAGE flights be carried out by year 2000
 - Recommends SAGE III rather than SAGE II

Measurements of Tropospheric Aerosol

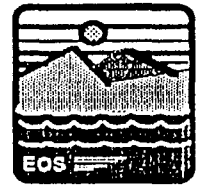
- Recommends proposed MISR polarization measurement on EOS AM-1 be included expeditiously by EOS Project
 - Retracted by MISR Team

Solar Irradiance Monitoring

- Recommends flight within 3-4 years of solar monitoring from a small satellite or flight of opportunity
 - Recommends that plans for prompt flight of continued solar monitoring include SOLSTICE as well as ACRIM

EOS

Payload Panel Recommendations



Wide Band Data Collection System (WBDCS)

- At the next Payload Panel Meeting, the WBDCS Team should be prepared to justify the inclusion of the WBDCS on an EOS platform in the context of other EOS priorities

Scatterometer Data for EOS

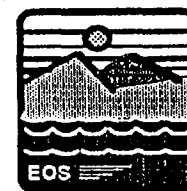
- Reaffirms the necessity of flying an NSCAT-class scatterometer throughout the EOS time frame.
 - Specifically encourages discussions with NASDA for flight of NSCAT-2 on ADEOS-II in 1999

Satellite Radar Altimeter

- Recommends NASA proceed immediately to identify and secure funding to proceed with a joint U.S./France TOPEX follow-on mission to launch in 1998
 - As an alternative, examine concept of moving EOS-Altimetry mission forward to near 1998
 - Red/Blue Team recommended altimetry mission in 2002

EOS

Payload Panel Recommendations



DESCOPING OR FAILURE TO FUND MAJOR INSTRUMENTS

AIRS

- Supports Red/Blue Team's recommendation to reduce AIRS from two to a single spectrometer

Notes from AIRS Meeting September 22-24, 1992:

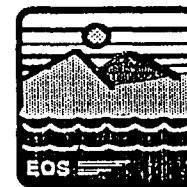
- Still achieves 1 degree, 1 km performance
- Eliminates registration/co-registration problem. Cuts down number of coolers — improved SNR follows
- Losses: spectral gaps in coverage affecting emissivity determination for clouds and surface; loss of high-resolution reflected visible high-resolution coverage affecting water vapor measurements; loss of global mapping for minor constituents, e.g., CO
- Sturdier instrument

MODIS

- Urges that the Project and Program proceed carefully before instituting any further reductions in specifications and capability of MODIS

EOS

Payload Panel Recommendations



LAWS

- Encourages NASA to develop interagency and international partnerships, involving the LAWS team, that would lead to achieving measurements of the tropospheric wind field

EOS SAR

- Encourages NASA to develop interagency and international partnerships to design and build a multifrequency, multipolarization SAR that will address the broad science objectives of global climate change

EOS

Payload Panel Recommendations



INTERNATIONAL INSTRUMENTS ON EOS PLATFORMS

- ASTER
 - Should be flown out of phase with Landsat 7 for eight-day interleaved coverage
 - Cooperation with NASDA, whereby we fly ASTER on EOS AM-1 and they fly NSCAT on ADEOS and CERES and LIS on TRMM, is crucial to EOS mission's dynamical observations
- MIMR
 - Given possibility that new microwave radiometers may be flown by DOD, ESA, and NASDA in FY1998-2000, need to consider desirability of overlap of so many similar instruments

EOS

Payload Panel Recommendations

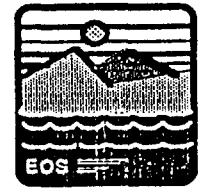


OTHER RECOMMENDATIONS:

- Reduce contingency held to handle unexpected problems
 - Risk reduced because instruments will be flown at 5-year intervals allowing ability to fix problems or change science specifications
- Depend increasingly upon European and Japanese partners

EOS

Payload Panel Recommendations EOSDIS



EOS Data Products

- Science panels and instrument teams of IWG must systematically develop the list of core data products, including science requirements, algorithm heritage, alternative approaches, and intermediate products
- EOS Project must work with appropriate EOS investigators to better estimate data system loads associated with each product, and consider whether the data product should be produced routinely or only on-demand, and whether the coded algorithm could be distributed instead of the calculated data product

Transition from Version 0 to Version 1

- EOS Project must work with the science community in the development of the transition to ensure necessary services are maintained and required capabilities added in an orderly manner.

EOSDIS User Model

- EOS Project must develop a user model based on investigators' proposed work with EOS instruments, on existing scientific data production systems, and on processing scenarios and benchmarks.
- EOSDIS IV&V contract must support the EOS Project's effort to examine the system from the scientific users' viewpoints.

EOS

Payload Panel Recommendations EOSDIS



Effects of Budget Reductions on EOSDIS

- The EOS IWG (through its EOSDIS Advisory Panel) must examine the architecture, design, and assumptions of the selected contractor, and analyze the cost sensitivity of the system's attributes.

Other Procurements: EDOS, ECOM, IV&V

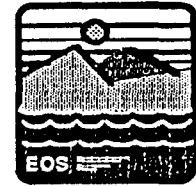
- NASA should design flexibility into EOSDIS to support network data delivery via networks whenever economically feasible, and plan for the insertion of NREN technology in EOSDIS when it is operationally available.
- The IV &V contract must provide specific analysis and testing functions appropriate for the evolutionary development of EOSDIS.
- Recommends that IV&V contract provide specific analysis and testing functions appropriate for the evolutionary development of EOSDIS, to assure that the design of the system fully and correctly implements the requirements, that evolutionary changes are implemented consistently and correctly to best meet the scientists' needs, and that costly redesigns are avoided.

Data Assimilation in EOSDIS

- The EOS IWG and the broader science community must evaluate the scientific requirements for assimilated data available through EOSDIS, so that the processing loads can be accommodated.

EOS

EOS Investigators Recommendations October 1991



Instruments and Clusters for 1997-2000:

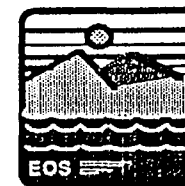
<i>NASA AM Cluster</i>	<i>NASA PM Cluster</i>	<i>ADEOS-II</i>	<i>Free Flyers</i>
ASTER†	AIRS	NSCAT-2	SeaWiFS-2
CERES(2)	AMSU		TOPEX/Poseidon-2
MISR	CERES(2)		TRMM-2‡
MODIS	MHS†		
	MIMR†		
	MODIS		
<i>Polar Orbit of Opportunity</i>	<i>Inclined Orbit of Opportunity</i>	<i>Other Orbit of Opportunity</i>	
HIRDLS†	CERES	ACRIM	
MOPITT†	LIS	SOLSTICE	
SAGE III	SAGE III		

† supplied by international partner

‡ joint U.S.-international effort

EOS

EOS Investigators Recommendations October 1991



Instruments and Clusters for the Early 21st Century:

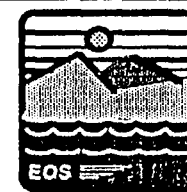
<i>NASA Missions</i>	<i>NASA AM Clusters</i>	<i>NASA PM Clusters</i>	<i>Free Flyers</i>
ALT	CERES	AIRS	LAWS
GLAS	EOSP	AMSU	TRMM-3†
GGI	HIRIS	CERES	
MLS or SAFIRE	MISR	MHS†	<i>Flights of</i>
TES	MODIS	MIMR	<i>Opportunity</i>
TMR	SAGE III	MODIS	ACRIM
		MODIS-T	EOSP
		STIKSCAT	HIRDLS†
			SAGE III (57°)
			SOLSTICE

† supplied by international partner

‡ joint U.S.-international effort

EOS

Payload Proposal to Congress March 1992



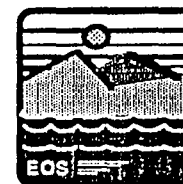
Payload of the Restructured EOS:

<i>TRMM, 1997</i> 28° orbit CERES LIS	<i>AM-1, 1998</i> <i>polar orbit</i> ASTER† CERES MISR MODIS MOPITT†	<i>Color, 1998</i> <i>polar orbit</i> SeaWiFS-2	<i>Aerosol-1, 2000</i> 57° orbit SAGE III
<i>PM-1, 2000</i> <i>polar orbit</i> AIRS AMSU CERES MHS† MIMR† MODIS WBDCS	<i>Altimetry, 2002</i> <i>polar orbit</i> ALT GGI GLAS TMR	<i>Chemistry, 2002</i> <i>polar orbit</i> HIRDLS‡ SAGE III STIKSCAT TES	<i>AM-2, 2003</i> <i>polar orbit</i> CERES EOSP HIRIS MISR MODIS
<i>Aerosol-2, 2003</i> 57° orbit EOSP SAGE III	<i>PM-2, 2005</i> <i>polar orbit</i> AIRS AMSU CERES MHS† MIMR† MODIS		

† supplied by international partner
‡ joint U.S.-international effort

EOS

Payload Proposal—Red/Blue Team September 1992



TRMM†, 1997 28° orbit CERES LIS	AM-1, 1998 polar orbit ASTER† CERES MISR MODIS MOPITT†	Color, 1998 polar orbit SeaWiFS-2	Undefined Flight of Opportunity†, 1999/2000 SAGE III
ADEOS-II†, 1999/ 2000, polar orbit NSCAT-2	PM-1, 2000 polar orbit AIRS AMSU CERES MHS† MIMR† MODIS WBDCS	Altimetry, 2002 polar orbit DORIS† GLAS SSA† TMR	Chemistry, 2002 polar orbit ACRIM HIRDLS† MLS or SAFIRE SAGE III SOLSTICE
AM-2, 2003 polar orbit CERES EOSP MISR MODIS TES	PM-2, 2005 polar orbit AIRS AMSU CERES MHS† MIMR† MODIS		

† supplied by international partner

‡ joint U.S.-international effort